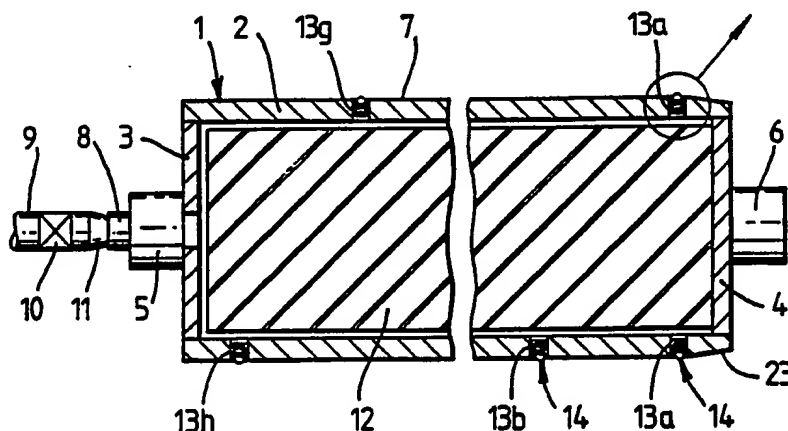




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(21) International Application Number: PCT/SE90/00568 (22) International Filing Date: 6 September 1990 (06.09.90) (30) Priority data: 8903004-3 13 September 1989 (13.09.89) SE (71) Applicant (for all designated States except US): MILLER GRAPHICS AKTIEBOLAG [SE/SE]; Brårudsallén, S-686 00 Sunne (SE). (72) Inventors; and (75) Inventors/Applicants (for US only) : PERSSON, Rolf, S. [SE/SE]; Pl 3233, S-686 00 Sunne (SE). JANSON, Per-Olof [SE/SE]; Frödingsvägen 10, S-686 00 Sunne (SE). (74) Agent: HYNELL, Magnus; Hynell Patenttjänst AB, Box 236, S-683 02 Hagfors (SE).		(81) Designated States: AT, AT (European patent), AU, BB, BE (European patent), BF (OAPI patent), BG, BJ (OAPI patent), BR, CA, CF (OAPI patent), CG (OAPI patent), CH, CH (European patent), CM (OAPI patent), DE*, DE (Utility model)*, DE (European patent)*, DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GA (OAPI patent), GB, GB (European patent), HU, IT (European patent), JP, KP, KR, LK, LU, LU (European patent), MG, ML (OAPI patent), MR (OAPI patent), MW, NL, NL (European patent), NO, RO, SD, SE, SE (European patent), SN (OAPI patent), SU, TD (OAPI patent), TG (OAPI patent), US. Published <i>With international search report.</i> <i>In English translation (filed in Swedish).</i>

(54) Title: PRINTING ROLL CORE



(57) Abstract

A printing roll core for a printing roll comprising such a core (1) and a sleeve (22) which is provided to be mounted on the core from one end thereof and to be displaced along the core to and from working positions on the core by causing compressed air to flow out through passages (13a-13h) terminating in outlets distributed along the outer surface of the core, so that the sleeve from a state in which the sleeve tightly fits the core, when compressed air is not caused to flow through said outlets, may be expanded by causing air to flow through said outlets, so that the sleeve may be displaced along the core. The passages may be connected to a source of compressed air which preferably are common for said passages. In each of said passages is provided a valve (14) and each such valve includes an opening member (17, 19) having an outer portion (19) extending beyond the outer surface (7) of the exterior portion (2) of the core when the valve is closed and said outer portion is in its outer position, said outer portion being displaceable through outer mechanical action from said outer position to an inner position essentially interior of or coinciding with the outer surface of the core, wherein the valve is opened such that compressed air may flow out through the opening in the surface of the core, said mechanical action being performed by the sleeve as said sleeve is being mounted on the core, wherein the valves are successively opened as the sleeve is brought into contact with their outer portions and are closed again when the sleeve has passed the opening in question.

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PRINTING ROLL CORE

TECHNICAL FIELD

5 This invention relates to a printing roll core for a printing roll comprising such a core and one or more sleeves which are provided to be mounted on the core from one end thereof and to be displaced along the core to and from working positions on the core by causing compressed air to flow out through passages terminating in outlets distributed along the outer surface of the core, so that the sleeve from a state in which the sleeve tightly fits the core, when compressed air is not caused to flow through said outlets, may be expanded by causing air to flow through said outlets, so that the sleeve may be displaced along the core.

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BACKGROUND OF THE INVENTION

Printing roll cores of the above mentioned type are known since long and are extensively used within the graphic industry. For example may be mentioned those printing roll core designs which are described in US-A-3 146 709 and G-A-1 581 232. A drawback of these known printing roll cores is that compressed air is flowing out through all the outlets in the surface of the core when the sleeve is being mounted on the core or is being removed from it. In order that this known system shall function it has therefore been necessary to concentrate the majority of the outlets to a region of the surface of the core adjacent to that end of the core where the mounting operation is initiated, while only one single outlet is located at the central part of the surface of the core. The reason for this that the sleeve already initially shall be caused to cover the majority of the outlets through which compressed air is caused to flow out since the fall of pressure otherwise would be so large that the sleeve would not be able to be sufficiently expanded. This compromise, however, means that a plurality of sleeves cannot be mounted side by side on one and the same core, which is a serious limitation since it is often desirable to make a plurality of printings side by side in one and the same printing unit. Another drawback is that a sleeve which by mistake has

been displaced so far along the core that it has passed the central outlet will be locked on the core without any possibility to be released.

5 BRIEF DISCLOSURE OF THE INVENTION

The purpose of the invention is to provide an improved printing roll core, in which the above mentioned drawbacks and limitations have been eliminated in a simple way. These and other objectives may be achieved therein that the invention is characterized by what is stated in the
10 appending claims.

Further characteristic features, aspects and advantages of the invention will be apparent from the following description of a preferred embodiment.

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BRIEF DESCRIPTION OF DRAWINGS

In the following description of a preferred embodiment reference will be made to the accompanying drawings, in which

20 Fig. 1 is a longitudinal sectional view through a printing roll core according to the invention;

Fig. 1A shows an encircled detail of Fig. 1 at a larger scale;

25 Fig. 2 shows the same printing roll core as in Fig. 1 with a sleeve partly mounted on the core; and

Fig. 3 shows a printing roll core with a plurality of sleeves mounted side by side on the core.

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DESCRIPTION OF PREFERRED EMBODIMENT

A printing roll core has been generally designated 1. It consists according to the embodiment of a cylindrical shell 2 (also a slightly tapered core may be conceived) and two end portions 3 and 4 provided
35 with axle bars 5 and 6. The cylindrical outer surface of the shell 2 has been designated 7. Compressed air can be supplied from a source of

compressed air through a compressed air hose 9 via a connection nozzle 8 in axle bar 5. In hose 9 there may optionally be provided a valve for opening and closing the connection. The supply of compressed air may be effected either by opening the valve 10 or by connecting the mouth piece 11 of hose 9 to the connection nozzle 8 of the axle bar 5. When closing the supply the operation is reverse. In the interior of the printing roll core 1 is a fill body 12 of rigid cellular plastic material which reduces the air volume in the interior of the core to the thin gaps between on one side the shell 2 and the end portions 3 and 4, and on the other side the said fill body 12.

In the shell 2 there are in a manner known per se provided a number of passages 13a, 13b ... 13h. In each such passage is a nonreturn valve 14. More particularly the valve 14 is a ball valve of well known type, as is shown in Fig. 1A. In the passage 13a there is provided a valve seat 15 having an outer annular border line which essentially coincides with the outer surface 7 of the shell. A steel ball 17 is pressed towards the seat 15 by means of a spring 18. In the closing position of the valve the ball 17 extends beyond the outmost part of the valve seat 15 and also beyond the outer surface of the shell 2 by an outer portion 19 which has the shape of a spherical calotte.

The sleeve - or the sleeves - which shall be mounted on the printing roll core 1 may be designed in a manner per se and consist of an inner shell 20 of reinforced plastics and an outer tube 21 of rubber with an exterior cliché. The sleeve has been generally designated 22, Fig. 2. When the sleeve 22 shall be mounted on the core 2 the compressed air hose 9 is connected to the nozzle 8, and the valve 10 is opened so that the interior of the core is subjected to an overpressure. No air, however, can flow through the passages 13a-13h as the valves 14 are closed. The sleeve 22 is mounted, starting in the right hand portion of the core 2, which portion in this case is the initial mounting end. The end portion 23 therefore suitably is somewhat tapered in order to facilitate the initial mechanical mounting operation. When the sleeve 22 thus has been mounted so far that it has passed the tapered portion 23, the sleeve 22 will with its interior side press the balls 17 of

the valves 14 into the passages 13a under compression of spring 18. Herein the valves are opened in a manner known per se and air flows out through the outlets of these first passages 13a such that the sleeve 22 will be expanded to a sufficient degree in order that it readily may be further moved over the core 2. The other valves 14, i.e. the valves in passages 13b-13h, are still closed but they will successively be opened as they are covered by the sleeve 22 during the continued movement of the sleeve along the core 2.

Fig. 3 illustrates the case when a plurality of sleeves 22a, 22b, 22c, and 22d are mounted on a core 1. This may be made without problems according to the invention as the shell 2 of the core 1 may be provided with a plurality of valve provided passages 13a-13h. These has been indicated in Fig. 1 only by an X. It is also possible according to the invention to provide only one or a couple of comparatively short sleeves on a comparatively long core 1, so that the sleeves only will cover a minor portion of the core, a possibility which sometimes is worthwhile.

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CLAIMS

1. Printing roll core for a printing roll comprising such a core (1) and a sleeve (22) which is provided to be mounted on the core from one end thereof and to be displaced along the core to and from working positions on the core by causing compressed air to flow out through passages (13a-13h) terminating in outlets distributed along the outer surface of the core, so that the sleeve from a state in which the sleeve tightly fits the core, when compressed air is not caused to flow through said outlets, may be expanded by causing air to flow through said outlets, so that the sleeve may be displaced along the core, c h a r a c t e r i z e d in that said passages may be connected to a source of compressed air, which preferably is common for said passages, that a valve (14) is provided in each of said passages, and that each such valve includes an opening member (17, 19) having an outer portion (19) extending beyond the outer surface (7) of the exterior portion (2) of the core when the valve is closed and said outer portion is in its outer position, said outer portion being displaceable through outer mechanical action from said outer position to an inner position essentially interior of or coinciding with the outer surface of the core, wherein the valve is opened such that compressed air may flow out through the opening in the surface of the core, said mechanical action being performed by the sleeve as said sleeve is being mounted on the core, wherein the valves are successively opened as the sleeve is brought into contact with their outer portions and are closed again when the sleeve has passed the opening in question.

2. Printing roll core according to claim 1, c h a r a c t e r i z e d in that the valves consist of ball valves, said outer portion consisting of a portion of the ball.

3. Printing roll core according to claim 1, c h a r a c t e r i z e d in that in the interior of the core there is provided a fill body (12) which reduces the air volume of the core to a space between on one side the shell and the two end portions (3, 4) of the core and on the other side said fill body (12).

INTERNATIONAL SEARCH REPORT

International Application No **PCT/SE 90/00568**

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC5: B 41 F 13/10, 27/12											
II. FIELDS SEARCHED <div style="text-align: center;">Minimum Documentation Searched⁷</div> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%; border: none;">Classification System</td> <td style="border: none;">Classification Symbols</td> </tr> <tr> <td style="border: 1px solid black; height: 40px; vertical-align: bottom;">IPC5</td> <td style="border: 1px solid black; height: 40px; vertical-align: bottom;">B 41 F</td> </tr> </table> <div style="text-align: center; padding-top: 5px;">Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched⁸</div> <p style="padding-top: 10px;">SE,DK,FI,NO classes as above</p>			Classification System	Classification Symbols	IPC5	B 41 F					
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IPC5	B 41 F										
III. DOCUMENTS CONSIDERED TO BE RELEVANT⁹ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Category *</th> <th style="width: 60%;">Citation of Document,¹¹ with indication, where appropriate, of the relevant passages¹²</th> <th style="width: 30%;">Relevant to Claim No.¹³</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td>SE, B, 403454 (TETRA PAK INTERNATIONAL AB) 21 August 1978, see the whole document --</td> <td style="text-align: center; vertical-align: top;">1-3</td> </tr> <tr> <td style="text-align: center; vertical-align: top;">Y</td> <td>SE, B, 436717 (O.Ö. JOHNSON) 21 January 1985, see abstract; figures 1-3 -- -----</td> <td style="text-align: center; vertical-align: top;">1-3</td> </tr> </tbody> </table>			Category *	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³	Y	SE, B, 403454 (TETRA PAK INTERNATIONAL AB) 21 August 1978, see the whole document --	1-3	Y	SE, B, 436717 (O.Ö. JOHNSON) 21 January 1985, see abstract; figures 1-3 -- -----	1-3
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<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>* Special categories of cited documents:¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance, the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance, the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"&" document member of the same patent family</p> </div> </div>											
IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;">Date of the Actual Completion of the International Search</td> <td style="width: 50%; border: none;">Date of Mailing of this International Search Report</td> </tr> <tr> <td style="border: 1px solid black; height: 40px; vertical-align: bottom;">27th November 1990</td> <td style="border: 1px solid black; height: 40px; vertical-align: bottom;">1990 -12- 0 7</td> </tr> <tr> <td style="border: none;">International Searching Authority</td> <td style="border: none;">Signature of Authorized Officer</td> </tr> <tr> <td style="border: 1px solid black; height: 40px; vertical-align: bottom;"> <div style="text-align: center;">SWEDISH PATENT OFFICE</div> </td> <td style="border: 1px solid black; height: 40px; vertical-align: bottom;"> <div style="text-align: center;"> Hans Peterson </div> </td> </tr> </table>			Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	27th November 1990	1990 -12- 0 7	International Searching Authority	Signature of Authorized Officer	<div style="text-align: center;">SWEDISH PATENT OFFICE</div>	<div style="text-align: center;"> Hans Peterson </div>	
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**ANNEX TO THE INTERNATIONAL SEARCH REPORT
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This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report.
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
SE-B- 403454	78-08-21	NONE	
SE-B- 436717	85-01-21	SE-A- 8007733	82-05-05